AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (currently amended) A method for determining the direction of a flickering source in relation to a measurement point in an electrical network, the method comprising the steps: of

- recording, at a measuring point, an amplitude-modulated current signal (i(n)), the recorded current signal comprising i) signals that originate from the network frequency (f_c) and ii) low-frequency current amplitude variations in the current signal (i(n));

- recording, at a measuring point, an amplitude-modulated voltage signal (u(n)), the recorded voltage signal comprising i) signals that originate from the network frequency (f_c) and ii) low-frequency voltage amplitude variations in the voltage signal (u(n));

- demodulating the recorded current signal (i(n)) and extracting, from the demodulated current signal, only the low-frequency current amplitude variations, the extracted low-frequency current amplitude variations representing ~~in the form of~~ a flicker component for the current signal (i(n));

- demodulating the recorded voltage signal (u(n)) and extracting, from the demodulated voltage signal, only the low-frequency voltage amplitude variations, the extracted low-frequency voltage amplitude variations representing ~~in the form of~~ a flicker component for the voltage signal (u(n));

- creating a product by multiplication of the flicker component for the current signal and the flicker component for the voltage signal;

- creating one of i) an average value of the instantaneous power signal (Π(n)) and ii) a summation of the partial powers Pk, wherein a flicker power (Π) is obtained with a sign value that indicates the direction the flickering source is located in relation to the measurement point; and

- displaying an indication of the direction that the flickering source is located in relation to the measurement point, wherein,

- said step of demodulating the recorded current signal comprises the steps:

- creating a first demodulated signal by demodulating the recorded current signal (i(n)); and

- filtering, by one of i) a band pass filter and ii) a multiplication of weight distribution factors, the first demodulated signal to eliminate the signals that originate from the network frequency (f_c) in the first demodulated signal so that only the low-frequency current amplitude variations remain,

the remaining low-frequency current amplitude variations representing ~~in the form of~~ the flicker component for current, and

- said step of demodulating the recorded voltage signal (u(n)) comprises the steps:

- creating a second demodulated signal by demodulation of the recorded voltage signal; and

- filtering, by one of i) a band pass filter and ii) a multiplication of weight distribution factors, the second demodulated signal to eliminate the signals that originate from the network frequency in the second demodulated signal so that only the low-frequency voltage amplitude variations remain, the remaining low-frequency voltage amplitude variations representing ~~in the form of~~ the flicker component for voltage.

2. (previously presented) The method of Claim 1, wherein the sign value of the flicker power is negative when the flickering source is located below (19) the measurement point (17) and the sign value is positive when the flickering source is located above (18) the measurement point (17).

3. (canceled)

4. (currently amended) The method of Claim 1, comprising the further steps of:

- filtering the signals that originate from the network frequency (f_c) in the first demodulated signal so that only the low-frequency current amplitude variations relating to the flicker component for current remain~~ in the form of a flicker signal ($I_{LF(n)}$) for current~~;

- filtering the signals that originate from the network frequency in the second demodulated signal so that the low-frequency voltage amplitude variations relating to the flicker component for voltage remain~~ in the form of a flicker signal ($U_{LF(n)}$) for voltage~~;

- creating an instantaneous power signal ($\Pi(n)$) by forming a product by multiplication of the flicker signal ($I_{LF(n)}$) for current and the flicker signal ($U_{LF(n)}$) for voltage; and

- processing the product to create the average value of the instantaneous power signal ($\Pi(n)$) whereby the flicker power (Π) is created with the sign value.

5. (previously presented) The method of claim 1, wherein,

- creating the first demodulated signal is by square demodulation of the current signal; and

- creating the second demodulated signal is by square demodulation of the voltage signal.

6. (currently amended) The method of claim 1, wherein, the filtering of the first demodulated signal ~~for current~~ is carried out with a bandpass filter with a lower limit of 0.1 Hz and an upper limit of 35 Hz.

7. (currently amended) A method of diagnosing at a measurement point in an electrical network, the method comprising the steps of:

- recording an amplitude-modulated current signal (i(n)) comprising signals that originate from the network frequency (f_c) and ~~the~~ low-frequency current amplitude variations in the current signal (i(n));

- recording an amplitude-modulated voltage signal (u(n)) comprising signals that originate from the network frequency (f_c) and ~~the~~ low-frequency voltage amplitude variations in the voltage signal (u(n));

- analyzing the frequency ~~of the wave form~~ of the voltage signal (u(n)) by an N-point DFT analysis (Discrete Fourier Transform), to determine a voltage vector (U) containing the frequency spectrum for the voltage signal (u(n)) in the form of N complex voltages, each of the N complex voltages corresponding to a different frequency;

- analyzing the frequency ~~of the wave form~~ of the current signal (i(n)) by an N-point DFT analysis (Discrete Fourier Transform), to determine a current vector (I) containing

the frequency spectrum for the current signal (i(n)) in the form of N complex currents, each of the N complex currents corresponding to a different frequency;

- creating a power vector (P) by multiplying, for each frequency, a corresponding one of the N complex voltages of the voltage vector (U) with a corresponding one of the N complex currents of the current vector (I);

- eliminating the power component originating from the network frequency from the power vector (P) by multiplying the power vector (P) by a weighting vector (W) so that the power vector (P), after the multiplication, comprises partial powers (P_k) concerning power components from the flickering source;

- creating a flicker power (Π) with a sign value by summation of the partial powers (P_k);

- analyzing the sign value~~, with the sign value indicating~~ to determine the direction, from the measurement point, that the flickering source is to be found; and

- displaying an indication of the direction that the flickering source is located in relation to the measurement point.

8. (previously presented) The method of Claim 6, wherein the flicker power (Π) is created by the following step:

- summing the partial powers (P_k) by the formula:

$$\Pi = \sum_{k=1}^{N} \mathrm{Re}\left\{\frac{1}{2} W_k \cdot U_k \cdot I_k^{\ *}\right\}$$

.

9. (currently amended) The method of Claim 6, wherein the flicker power (Π) is created by the following steps:

- square-demodulation (x^2) of the voltage signal (u(n));
- square-demodulation (x^2) of the current signal (i(n));
- calculating the frequency spectrum of the square-demodulated voltage signal by an N-point DFT analysis (Discrete Fourier Transform) to determine the voltage vector (U);
- calculating the frequency spectrum of the square-demodulated current signal by an N-point DFT analysis (Discrete Fourier Transform) to determine the current vector (I); and
- creating the flicker power (Π) by summation of the partial powers (P_k) contributing to the flicker ~~phenomenon~~ by the formula:

$$\Pi = \sum_{k=1}^{N} \mathrm{Re}\left\{\frac{1}{2} w1_k \cdot U_k \cdot w2_k \cdot I_k^{*}\right\}$$

where the elements $w1_k$ and $w2_k$ eliminate the power component originating from the network frequency and weight the

correct amplitudes of the frequency components U_k and I_k, in accordance with:

$$w1_k = \begin{Bmatrix} \frac{1}{U_c} & \textit{for} \ 1 \le k \le i \\ 0 & \textit{for} \ k > i \end{Bmatrix}$$

$$w2_k = \begin{Bmatrix} \frac{1}{I_c} & \textit{for} \ 1 \le k \le i \\ 0 & \textit{for} \ k > i \end{Bmatrix}$$

where the low-frequency flickers are to be found in a frequency band up to and including tone i ($0 < f_{flicker} \le i$).

10. (canceled)

11. (currently amended) An arrangement for deciding the direction to a flickering source in relation to a measurement point in an electricity network, the arrangement comprising:

- a first recorder for recording an amplitude-modulated current signal (i(n)) comprising signals that originate from the network frequency (f_c) and ~~the~~ low-frequency current amplitude variations in the current signal (i(n));

- a second recorder for recording an amplitude-modulated voltage signal (u(n)) comprising signals that originate from the network frequency (f_c) and ~~the~~ low-frequency voltage amplitude variations in the voltage signal (u(n));

- a first signal processor for demodulating the current signal (i(n)) and extracting, from the demodulated current signal, only the low-frequency current amplitude variations ~~in the form of~~ that represent a flicker component for the current signal (i(n));

- a second signal processor for demodulating the voltage signal (u(n)) and extracting, from the demodulated voltage signal, only the low-frequency voltage amplitude variations ~~in the form of~~ that represent a flicker component for the voltage signal (u(n));

- a multiplier for creating a product by multiplication of the flicker component for current and the flicker component for voltage;

- a processor for processing the product to create one of i) an average value of the instantaneous power signal (Π(n)) and ii) a summation of the partial powers Pk, wherein a flicker power (Π) is obtained with a sign value that indicates the direction the flickering source is located in relation to the measurement point; and

- a display for displaying an indication of the direction that the flickering source is located in relation to the measurement point, wherein,

- the first signal processor for ~~signal processing of~~ the current signal (i(n)) comprises:

- a first part for creating a first demodulated signal by means of demodulation of the current signal (i(n)), and [[;]]

- a second part for filtering to remove the signals that originate from the network frequency (f_c) in the first demodulated signal so that only the low-frequency current amplitude variations ~~remain~~ ~~in the form of~~ that represent the flicker component for current remain;

- the second signal processor for the voltage signal (u(n)) ~~means for signal processing of the current signal (i(n))~~, comprises:

- ~~means~~ a first part for creating a second demodulated signal by means of demodulation of the voltage signal, and [[;]]

- a second part ~~signal processor~~ for filtering to remove the signals that originate from the network frequency in the second demodulated signal so that only the low-frequency voltage amplitude variations ~~remain in the form of~~ that represent the flicker component for voltage remain.

12. (currently amended) An arrangement for diagnostics at a measurement point in an electrical network, the arrangement comprising:

- a first recorder for recording an amplitude-modulated current signal (i(n)) comprising signals that originate from the network frequency (f_c) and the low-frequency current amplitude variations in the current signal (i(n));

- a second recorder for recording an amplitude-modulated voltage signal (u(n)) comprising signals that originate from the network frequency (f_c) and the low-frequency <u>voltage</u> amplitude variations in the voltage signal (u(n));

- a first signal processor for frequency analysis ~~of the wave form~~ of the voltage signal (u(n)) by an N-point DFT analysis (Discrete Fourier Transform), to determine a voltage vector (U) containing the frequency spectrum for the voltage signal (u(n)) in the form of N complex voltages, each of the N complex voltages corresponding to a different frequency;

- a second signal processor for frequency analysis ~~of the wave form~~ of the current signal (i(n)) by an N-point DFT analysis (Discrete Fourier Transform), to determine a current vector I containing the frequency spectrum for the current signal (i(n)) in the form of N complex currents, each of the N complex currents corresponding to a different frequency;

- a multiplier for the creation of a power vector (P) by the multiplication, at each frequency, of a corresponding one of the N complex voltages of the voltage vector (U) with a corresponding one of the N complex currents of the current vector (I);

- a first processor for the multiplication of the power vector (P) by a weighting vector (W) to eliminate the power component originating from the network frequency so that the power vector (P), after the multiplication, comprises partial

powers (P_k) concerning power components from the flickering source;

- a second processor for the creation of a flicker power (Π) with a sign value, by summation of the partial powers (P_k);

- an analyzer for analysis of the sign value~~, with the sign value~~ for indicating the direction, from the measurement point, that the flickering source is to be found; and

- a display for displaying an indication of that direction that the flickering source is located in relation to the measurement point, wherein,

- the first signal processor is configured to execute the steps of:

- creating a first demodulated signal by demodulation of the current signal (i(n)), and

- filtering to eliminate the signals that originate from the network frequency (f_c) in the first demodulated signal so that only the low-frequency current amplitude variations representing ~~remain in the form of~~ the flicker component for current remain,

- the second signal processor is configured to execute the steps of:

- creating a second demodulated signal by demodulation of the voltage signal;

- filtering to eliminate the signals that originate from the network frequency in the second demodulated signal so that only the low-frequency voltage amplitude variations ~~remain in the form of~~ that represent the flicker component for voltage remain.

13. (currently amended) A method for determining the direction of a flickering source in relation to a measurement point in an electrical network, the method comprising the steps:

- recording, at a measuring point, an amplitude-modulated current signal (i(n)) comprising signals that originate from the network frequency (f_c) and ~~the~~ low-frequency current amplitude variations in the current signal (i(n));

- recording, at a measuring point, an amplitude-modulated voltage signal (u(n)) comprising signals that originate from the network frequency (f_c) and ~~the~~ low-frequency voltage amplitude variations in the voltage signal (u(n));

- demodulating the recorded current signal (i(n)) and extracting, from the demodulated current signal, only the low-frequency current amplitude variations, the extracted low-frequency current amplitude variations representing ~~in the form of~~ a flicker component for the current signal (i(n));

- demodulating the recorded voltage signal (u(n)) and extracting, from the demodulated voltage signal, only the low-frequency voltage amplitude variations, the extracted low-

frequency voltage amplitude variations representing ~~in the form of~~ a flicker component for the voltage signal (u(n));

- creating a product by multiplication of the flicker component for the current signal and the flicker component for the voltage signal;

- creating one of i) an average value of the instantaneous power signal (Π(n)) and ii) a summation of the partial powers Pk wherein a flicker power (Π) is obtained with a sign value that indicates the direction the flickering source is located in relation to the measurement point; and

- displaying an indication of the direction that the flickering source is located in relation to the measurement point,

wherein the sign value of the flicker power is negative when the flickering source is located below (19) the measurement point (17) and the sign value is positive when the flickering source is located above (18) the measurement point (17), and

wherein,

- the demodulating of the current signal (i(n)) comprises the steps of:

- creating a first demodulated signal by demodulation of the current signal (i(n));

- filtering to eliminate the signals that originate from the network frequency (f_c) in the first demodulated signal

so that only the low-frequency current amplitude variations remain ~~in the form of the flicker component for current~~;

- the demodulating of the voltage signal (u(n)) comprises the steps of:

- creating a second demodulated signal by demodulation of the voltage signal; and

- filtering to eliminate the signals that originate from the network frequency in the second demodulated signal so that only the low-frequency voltage amplitude variations remain ~~in the form of the flicker component for voltage~~.

14. (previously presented) The method of claim 4, wherein,

- creating the first demodulated signal by square demodulation of the current signal; and

- creating the second demodulated signal by square demodulation of the voltage signal.

15. (currently amended) The method of claim 4, wherein,

the filtering of the first demodulated signal ~~for current~~ is carried out with a bandpass filter with a lower limit of 0.1 Hz and an upper limit of 35 Hz.

16. (currently amended) The method of claim 1, wherein, the filtering of the first demodulated signal ~~for current~~ is

carried out with a bandpass filter with a lower limit of 0.1 Hz and an upper limit of 25 Hz.

17. (currently amended) The method of claim 4, wherein, the filtering of the first demodulated signal ~~for current~~ is carried out with a bandpass filter with a lower limit of 0.1 Hz and an upper limit of 25 Hz.